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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,841	01/21/2004	Bernard Roy Katz	J762-001 US	3058

21706 7590 01/04/2006

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EXAMINER	
KRAMSKAYA, MARINA	

ART UNIT	PAPER NUMBER
2858	

DATE MAILED: 01/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/761,841	KATZ, BERNARD ROY	
	Examiner	Art Unit	
	Marina Kramskaya	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/11/2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claim 1 is objected to because of the following informalities: the phase in line 6 of claim 1, "a DC signal that is proportional the moisture content" should be "a DC signal that is proportional to the moisture content". Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-2, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner, US 5,486,815, in view of Biegel et al., US 4,823,600.

As per Claim 1, Wagner discloses a moisture sensing apparatus comprising:

- an oscillator **116** having an output for supplying an AC signal (ABS., line 5);
- a sensor having a sensor pad **120**, a driven ring **214** around the pad and connected to the oscillator **116** output (column 6, lines 33-35), and a ground plate **122** (column 5, lines 13-14) around the ring;

- a rectifier in combination with a low-pass filter (**157**) connected to the sensor for rectifying a signal from the sensor to form a DC signal (a DC signal, column 1, lines 62-64) that is proportional the moisture content (column 1, lines 64-67);
- an operational amplifier (1/4 IC1) having one input **3** connected to the pad, another input **2**, and an output **1**;
- a first diode **D2** connected to the output **1** of the operational amplifier (1/4 IC1) to nullify variations in the rectified signal that are due to temperature induced variations of diode parameters (column 2, lines 1-7), the first diode **D2** having an output for supplying a rectified signal (a DC signal, column 1, lines 62-64) that is a monotonic function of moisture content (column 1, lines 64-67) of material that is in contact with the sensor.

Wagner does not disclose

- a precision rectifier connected to the sensor for rectifying a signal from the sensor to form a DC signal that is proportional to the moisture content, the precision rectifier comprising:
- a first diode connected in a feedback loop between the operational amplifier output and the other input of the operational amplifier; and
- a second diode connected between the output and the other input of the operational amplifier for reducing output errors.

Biegel et al. discloses a moisture detection circuit (i.e. leak detection) comprising:

- a precision rectifier (**24**) connected to the sensor for rectifying a signal from the sensor to form a DC signal (column 6, lines 4-9) that is proportional to the

moisture content (i.e. electrical signal is proportional to the leak, see ABS.), the precision rectifier comprising:

- a first diode (**95**) connected in a feedback loop between the operational amplifier output and the other input (**- input**) of the operational amplifier (**90**); and
- a second diode (**93**) connected between the output and the other input (**- input**) of the operational amplifier (**90**) for reducing output errors.

Therefore, it would have been obvious to a person of ordinary skill in the art to include a precision rectifier with the first diode in a feedback connection and a second diode in a feed back connection, as taught by Biegel, in the moisture sensing apparatus of Wagner, in order to provide stability of the signal with more accuracy which the amplifier of the precision rectifier provides.

As per Claim 2, Wagner discloses a moisture sensing apparatus, including a reactive impedance (**154** (R12) & **156** (C7)) connected across the pad and ring of the sensor for providing a baseline signal for the rectified signal.

As per Claim 4, Wagner discloses the moisture sensing apparatus further including a differential amplified circuit **190** connected between the operational amplifier (by output **14** to input **3** of the operational amplifier) and the sensor for canceling part of a signal from the pad of the sensor (received by input **12**), using a sample of AC signal from the oscillator.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner, US 5,486,815, in view of Biegel et al., US 4,823,600 as applied to claims 1 & 2 above, and further in view of Stockton, US 5,859,536.

As per Claim 3, Wagner, as modified, discloses the moisture sensing apparatus as applied to Claim 2, above. Wagner further discloses the reactive impedance comprising series connected, resistance and capacitance members.

Wagner does not disclose the reactive impedance that comprises parallel connected, resistance and capacitance members.

Stockton discloses a reactive impedance comprising parallel connected, resistance **R2** and capacitance **C3** members, connected to the sensor pad **12** and driven electrode **10**.

Therefore, it would have been obvious to a person of ordinary skill in the art to use a reactive impedance that comprises parallel connected resistance and capacitance members, as taught by Stockton, in the sensing apparatus of Wagner, in order to provide impedance matching.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner, US 5,486,815, in view of Biegel et al., US 4,823,600, as applied to claim 1 above, and further in view of Howarth, US 4,845,421.

As per Claim 5, Wagner discloses the moisture sensing apparatus as applied to Claim 1, above. Wagner further discloses the sensor comprising means defining an support substrate (column 3, lines 10-13), the sensor pad **120** being on the support

substrate (column 3, lines 10-13), the driven ring being **214** on the support substrate and extending around the pad and spaced from the pad to define a first closed loop around the pad (column 3, lines 5-7), and the ground plate **122** being on the support substrate and extending around the ring and defining a second closed loop around the ring (column 3, lines 7-8), the pad, the ring and the plate all lying in a common contact plane for the sensor (column 3, lines 9-10), which contact plane is adapted to be in contact with a surface for measuring moisture content at the surface as a function of capacitance (column 1, lines 64-67) across the loops, the pad, the ring, the plate. Wagner discloses in column 4, lines 23-26, that the structure of the sensor of FIG. 2 is that of prior art in FIG. 1.

Wagner does not disclose the loops having no angular corners so as to avoid electrostatic field fringing effects.

Howarth discloses the loops in the sensor having no angular corners so as to avoid electrostatic field fringing effects (see FIG. 7B).

Therefore, it would have been obvious to a person of ordinary skill in the art to use a sensor having no angular corners, as taught by Howarth, in the sensor of Wagner, in order to eliminate electrostatic fringing in the corners, (see fringing in rectangular embodiment in FIG. 6 and no fringing in the circular embodiment of FIG. 7).

6. Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner, US 5,486,815, in view of Rynhart et al., US 2003/0169054, and Howarth, US 4,845,421.

As per Claim 6, Wagner discloses a contact sensor for a moisture sensing apparatus having an oscillator **116** with an output for supplying an AC signal (ABS., line 5) and an operational amplifier (1/4 IC1, with inputs **2** & **3** and output **1**) with rectifier means (diode **D2**) for supplying a rectified signal that is proportional to a moisture content of material that is in contact with a contact plane of the contact sensor (a DC signal, column 1, lines 62-67), the contact sensor comprising:

- means defining an support substrate (column 3, lines 10-13);
- a conductive sensor pad **120** on the support substrate (column 3, lines 10-13);
- a conductive driven ring **214** on the support substrate, extending around the pad and spaced from the pad to define a first closed loop around the pad (column 3, lines 5-7); and
- a conductive ground plate **122** on the support substrate, extending around the ring and defining a second closed loop around the ring (column 3, lines 7-8);
- the pad, the ring and the plate all lying in the contact plane for the sensor (column 3, lines 9-10), which contact plane is adapted to be in contact with a surface for measuring moisture content at the surface, as a function of capacitance across the loops (column 1, lines 64-67).

Wagner does not disclose

a precision rectifier,

a moisture sensing apparatus with the pad, the ring, the plate, and the loops having no angular corners to avoid electrostatic field fringing effects.

Rynhart discloses a moisture sensor with a precision rectifier (see paragraph [0042], lines 13-16).

Howarth discloses a moisture sensing apparatus having a pad, a ring, a plate, and loops having no angular corners to avoid electrostatic field fringing effects (see FIG. 7B).

Therefore, it would have been obvious to a person of ordinary skill in the art to use a sensor having no angular corners, as taught by Howarth, in the sensor of Wagner, in order to eliminate electrostatic fringing in the corners, (see fringing in rectangular embodiment in FIG. 6 and no fringing in the circular embodiment of FIG. 7). Further it would have been obvious to a person of ordinary skill in the art to use a precision rectifier, as taught by Rynhart, rather than a diode rectifier in combination with a low pass filter of Wagner, to produce an average of the incoming signal and produce a DC signal with more accuracy which the amplifier of the precision rectifier provides.

As per Claims 7-9, the applicant discloses that sensors of geometrical shape other than those with angular corners are suitable for an optimum sensor. Wagner in view of Howarth disclose the moisture sensing apparatus as applied to Claim 6, above.

Wagner does not teach of a sensor with no angular corners.

Howarth teaches of a circular sensor (FIG. 7B).

Therefore, it would have been obvious to a person of ordinary skill in the art to use a circular, oval, race-track, or a rectangular with rounded corners shaped sensor, in

order to eliminate electrostatic fringing. See MPEP 2144.04, *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

As per Claim 10, Wagner in view of Howarth disclose the moisture sensing apparatus as applied to Claim 6, above.

Wagner in view of Howarth do not explicitly teach the size (or radii) of the sensor component.

However, Howarth does teach a circular shaped sensor with a circular pad, ring, plate, and circular loops. It would have been obvious to a person of ordinary skill in the art to select a radius of an appropriate size through routine experimentation. See MPEP 2144.04, *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984).

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner, US 5,486,815, in view of Rynhart et al., US 2003/0169054.

Wagner discloses a moisture sensing apparatus comprising:

- an oscillator **116** having an output for supplying an AC signal (ABS., line 5);
- a contact sensor (combination of 120, 122, 214) connected to the oscillator for changing the AC signal as a function of moisture content at a surface in contact with the contact sensor (column 1, lines 64-67);

- a rectifier in combination with a low-pass filter (**157**) connected to the sensor for rectifying a signal from the sensor to form a DC signal (a DC signal, column 1, lines 62-64) that is proportional the moisture content (column 1, lines 64-67);
- a reactive impedance (**154** (R12) & **156** (C7)) connected across the sensor for providing a baseline signal for DC signal.

Wagner does not explicitly disclose the rectifier circuit as a precision rectifier connected to the sensor for rectifying a signal from the sensor to form a DC signal that is proportional the moisture content.

Rynhart et al. discloses a moisture sensor comprising a precision rectifier (see paragraph [0042], lines 13-16) connected to the sensor (**12**) for rectifying a signal from the sensor to form a DC signal (i.e. precision half-wave rectifiers produce the average AC signal, i.e. the DC value) that is proportional the moisture content (see paragraph [0042], lines 13-16).

Therefore, it would have been obvious to a person of ordinary skill in the art to use a precision rectifier, as taught by Rynhart, rather than a diode rectifier in combination with a low pass filter of Wagner, to produce an average of the incoming signal and produce a DC signal with more accuracy which the amplifier of the precision rectifier provides.

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner, US 5,486,815, and Rynhart et al., US 2003/0169054, in view of Stockton, US 5,859,536.

Wagner, as modified, discloses the moisture sensing apparatus as applied to Claim 11, above. Wagner further discloses the reactive impedance comprising series connected, resistance and capacitance members (**154** (R12) & **156** (C7)).

Stockton discloses a moisture sensing apparatus having a reactive impedance comprising parallel connected resistance **R2** and capacitance **C3** members, connected to the sensor pad **12** and driven electrode **10**.

Therefore, it would have been obvious to a person of ordinary skill in the art to use a reactive impedance that comprises parallel connected resistance and capacitance members, as taught by Stockton, in the sensing apparatus of Wagner, in order to provide impedance matching.

9. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner, US 5,486,815, and Rynhart et al., US 2003/0169054, and further in view of Howarth, US 4,845,421.

As per Claim 13, Wagner discloses the moisture sensing apparatus as applied to Claim 11, above.

Wagner does not disclose the sensor having a central pad with no angular corners.

Howarth discloses moisture sensing apparatus with he sensor having a central pad **31** with no angular corners (see FIG. 7B).

Therefore, it would have been obvious to a person of ordinary skill in the art to use a sensor having no angular corners, as taught by Howarth, in the sensor of

Wagner, in order to eliminate electrostatic fringing in the corners, (see fringing in rectangular embodiment in FIG. 6 and no fringing in the circular embodiment of FIG. 7).

10. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner, US 5,486,815, and Rynhart et al., US 2003/0169054, in view of Biegel et al., US 4,823,600.

As per Claim 14, Wagner discloses the moisture sensing apparatus as applied to Claim 11, above. Wagner further discloses a diode rectifier comprising:

- an operational amplifier (1/4 IC1) having one input **3** connected to a pad of the sensor, the operational amplifier having another input **2**, and an output **1**,
- a first diode **D2** connected to the output **1** of the operational amplifier to nullify variations in the DC signal that arise from temperature induced variations in diode parameters (column 2, lines 1-7), the first diode **D2** having an output for supplying the DC signal (column 1, lines 62-64).

Wagner does not disclose

- a precision rectifier comprising:
- an operational amplifier;
- a first diode connected in a feedback loop between the operational amplifier output and the other input of the operational amplifier,
- a second diode connected between the operational amplifier output and the other input of the operational amplifier.

Biegel et al. discloses

- a precision rectifier (**24**) comprising:
- an operational amplifier (**90**);
- a first diode (**95**) connected in a feedback loop between the operational amplifier output and the other input (**- input**) of the operational amplifier (**90**),
- a second diode (**93**) connected between the operational amplifier output and the other input (**- input**) of the operational amplifier (**90**).

Therefore, it would have been obvious to a person of ordinary skill in the art to include a precision amplifier with a first diode in a feedback connection and a second diode in a feed back connection, as taught by Biegel, in the moisture sensing apparatus of Wagner, in order to provide stability of the signal with more accuracy which the amplifier of the precision rectifier provides.

As per Claim 15, Wagner discloses the moisture sensing apparatus as applied to Claim 14, above. Wagner further discloses the moisture sensing apparatus, including a differential amplified circuit **190** connected between the operational amplifier (by output **14** to input **3** of the operational amplifier) and the sensor for canceling part of a signal from the pad of the sensor (received by input **12**), using a sample of AC signal from the oscillator.

Response to Arguments

11. Applicant's arguments, see remarks page labeled "12 of 19", filed 10/11/2005, with respect to the rejection(s) of claim(s) 11 under 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Wagner, US 5,486,815, and Rynhart et al., US 2003/0169054, for claim 11 and the further depending claims 12-15.

However, the new grounds of rejection for claims 1-10 have been necessitated by applicant's amendment.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marina Kramskaya whose telephone number is (571)272-2146. The examiner can normally be reached on M-F 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on (571)272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Marina Kramskaya
Examiner
Art Unit 2858

MK

DIANE I. LEE
PRIMARY EXAMINER